MINIATURIZED MASS SPECTROMETER

TECHNOLOGY READINESS LEVEL: 3

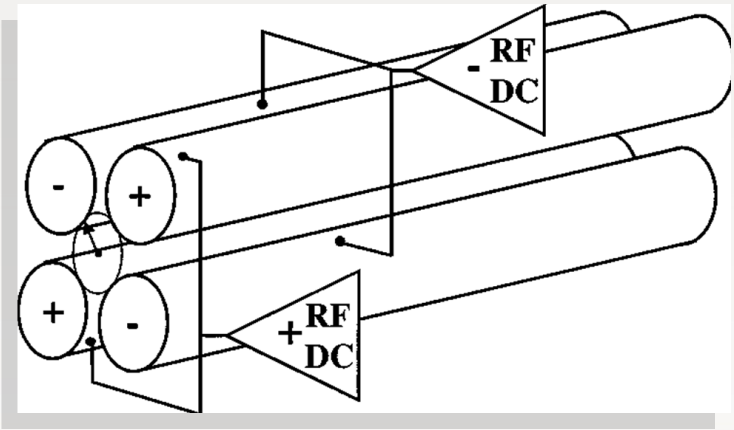
ACTIVE RESEARCH AND DEVELOPMENT IS INITIATED AND THE CONCEPTS WERE DEMONSTRATED ANALYTICALLY OR EXPERIMENTALLY.

US PATENT # 6,452,167
US PATENT # 6,633,041

TECHNOLOGY SUMMARY

Sandia's invention relates to a miniaturized mass spectrometer using a silicon chip field emitter array as the source of electrons for impact ionization of chemical species.

Sandia has developed an improved quadrupole mass spectrometer (QMS). The improvement lies in the substitution of the conventional hot filament electron source with a cold cathode field emitter array (FEA), which, in turn, allows the operations of a small QMS at much higher internal pressures then are currently achievable. By eliminating the hot filament, problems such as the thermal "cracking" of delicate analytes molecules, outgassing of a "hot" filament, high-power requirements, filament contamination by outgas species, and spurious electromagnetic fields are avoided altogether.



POTENTIAL APPLICATIONS

- Real-time exhaust gas analysis for automotive applications
- Leak detection, residual gas analysis
- Thermal desorption mass spectroscopy
- Environmental analysis for liquid and gas samples

TECHNOLOGICAL BENEFITS

- Low cost compared to other types of mass spectrometers
- Simple and reliable
- Relatively high pressure

TECHNOLOGY INQUIRY?

For more information or licensing opportunities contact us at

ip@sandia.gov

Refer to SD # 8174

or visit

https://ip.sandia.gov

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration.
SAND # 2011-4872P